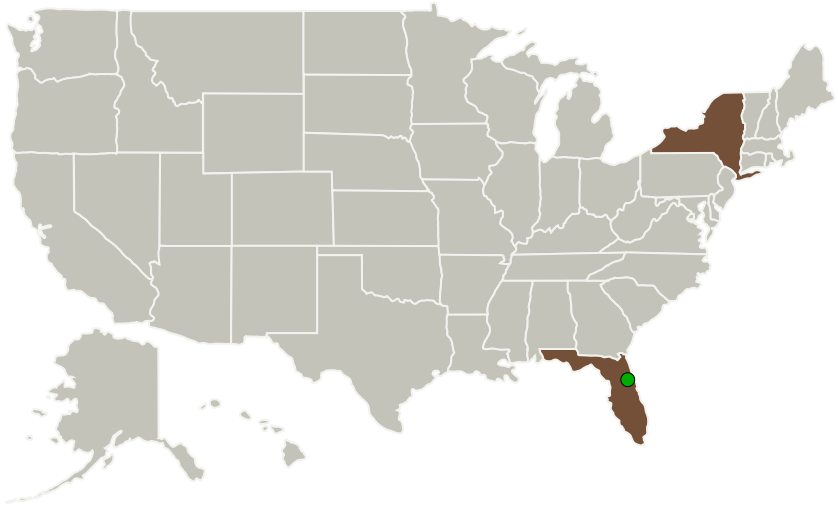
Parametric Optimization and Prediction Tool for Excavation and Prospecting Tasks, Phase II

Completed Technology Project (2011 - 2013)

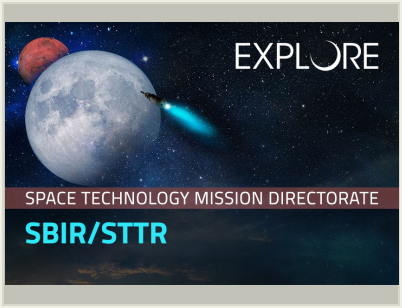
Project Introduction

Honeybee Robotics therefore proposed to develop a software tool for facilitating prospecting and excavation system trades in support of selecting an optimal architecture for the Moon. The tool could serve as a starting platform for excavation software for Mars or asteroids. The tool will provide engineers with the ability to quickly examine "What if?" scenarios within a trade space by specifying a surface system architecture (e.g. lander or rover based, digging for ice or building burms) and receiving reliable data and graphs evaluating that architecture's performance in terms relevant metrics, such as total energy used or total duration. The proposed software aims to be (a) user friendly, (b) relevant to NASA excavation priorities (xPRP: digging icy regolith for ISRU or LSS: outpost preparation), and (c) accurate for lunar excavation (equations verified by testing in relevant environment and scaled for gravity).

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Honeybee Robotics, Ltd.	Lead Organization	Industry	Pasadena, California
Kennedy Space Center(KSC)	Supporting Organization	NASA Center	Kennedy Space Center, Florida



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Primary U.S. Work Locations	
Florida	New York

Project Transitions

June 2011: Project Start

June 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139319)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Honeybee Robotics, Ltd.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

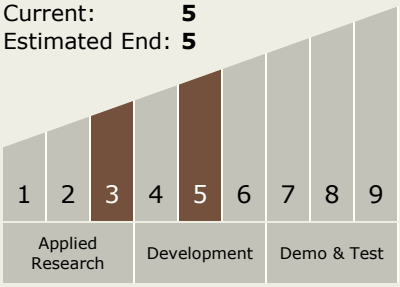
Carlos Torrez

Principal Investigator:

Kris Zacny

Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



Parametric Optimization and Prediction Tool for Excavation and Prospecting Tasks, Phase II

Completed Technology Project (2011 - 2013)

Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.3 Manipulation
    - TX04.3.4 Sample Acquisition and Handling

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System